第38卷 第2期
2000年 4 月
古 脊 椎 动 物 学 报
VERTEBRATA PALASIATICA
pp.128～134
pl.I

甘肃和政地区麝牛亚科一新属的初步报道[1)]

邱占祥[1] 王伴月[1] 颉光普[2]
(1 中国科学院古脊椎动物与古人类研究所 北京 100044)
(2 甘肃省博物馆 兰州 730050)

摘要 麝牛亚科新属新种 *Hezhengia bohlini* 是和政地区三趾马动物群中最特征的动物之一。其主要特征是：角心粗短无角柄，断面三角形，表面多沟槽，角先向侧后方伸出，再向前并微微向下伸展；顶骨面和枕骨面形成约 150°之角；眼眶向外突出弱；牙齿次高冠，上前臼齿相对较长。*Hezhengia* 虽然在麝牛亚科中的地位不容质疑，但它和其他各属的关系暂时还不清楚。

关键词 甘肃和政地区，晚中新世，麝牛
中图法分类号 Q915.876

1998 年 9 月本文作者在参观临夏州博物馆时，在其库房中看到了几个显然可以归入麝牛类的头骨化石。几天后在一位挖"龙骨"的农民家里，我们又发现了几个这样的头骨，它们和三趾马动物群其他一些常见的动物化石混在一起。这些头骨虽然保存得不太完整，我们还是把它们收集了起来。1999 年 1 月，邱占祥和颉光普受邀至和政县协助鉴定该县新近征集到的一批化石，这时我们才意识到这类从未报道过的麝牛类的动物乃是整个和政地区(包括邻县广和和东乡在内)三趾马动物群中最特征的动物之一。在 1000 余件以各种动物的头骨为主的化石中，我们发现了大约 170 个这样的头骨，在数量上仅次于大唇犀类，后者的头骨约为 270 个。对这些材料的详细研究需要系统地进行，并以专著形式发表。由于这类麝牛对我们来说是一种全新的动物，兹以简报形式先予报道。HMV 为和政县陈列馆脊椎动物化石编号，IVPP V 为中国科学院古脊椎动物与古人类研究所脊椎动物化石编号。

麝牛亚科 Ovibovinae Gill, 1872

步氏和政羊(新属、新种) *Hezhengia bohlini* gen. et sp. nov.

(图版 I)

正型标本 HMV 0922，头骨，缺吻部，和政县陈列馆标本，发现于广和县阿力麻土乡后山村。

归入标本 IVPP V 12346，一幼年个体的头骨和下颌，具完整牙列，其中 dP4 尚未脱

1) 国家自然科学基金项目(编号：49872011)、中国科学院"九五"重点项目(编号：KZ952-J1-410)和中国科学院古生物学与古人类学科基础研究特别支持基金项目(编号：9708)资助。
收稿日期：2000-01-06

落,p4 正在萌出中;V 12347,一老年个体头骨,双角缺损;V 12348,一成年个体头骨,额骨表面破损,角不完整;V 12349,一成年个体头骨,缺吻端,牙齿破损;V 12350,一个保存较完好的成年个体头骨,左角顶端破损。上述头骨的确切产地不详。

产出层位　上述化石均产于灰黄色泥质粉砂岩中。和政地区三趾马动物群的化石几乎全部产于这种岩石中。这一动物群在总体面貌上和保德三趾马动物群很相似,其时代可能也很接近,大约为晚中新世的中期。

特征　中等大小的一类麝牛。头基长约 300mm。角心粗短,角表面多沟槽,其中后方的一个沟槽特别深。角的断面三角形,前腹棱和后上棱明显,角先向侧方和稍后方伸出,再向前并微微向下伸展,角基和额骨间以深沟相隔,但无角柄,两角基部向后急剧趋近,中间仅留一缝隙。额骨顶面平,顶骨枕面接近垂直于额骨额面,而和枕骨枕面在枕脊顶部处形成约 150°之角。枕髁具侧附加关节面。基枕骨上的肌结节呈脊形隆起。眼眶呈微弱管状,向外突出弱。牙齿次高冠,上前臼齿相对较长,具强外褶和肋,上臼齿近方形,外肋很弱。

词源　属名表明该属动物的主要分布区极可能就是和政地区;种名献给为中国化石麝牛类研究作出重大贡献的瑞典古哺乳动物学家步林博士。

简短描述　正型标本为中年个体。从侧面看,顶部轮廓在鼻骨处平直,在额骨前半部处向后上方抬升,额骨的后半部又趋于水平。所以额面后部远高于鼻部。眼眶位于头骨高的中部,其前缘在 M3 稍后。眶下孔位于 P3 上方。顶骨从侧面看微凹,和枕骨枕面形成约 150°之角。从顶面看,整个头骨呈向前收缩的楔形。角心非常粗壮,末端不尖锐。角先向侧方和后方(很微弱)伸出,然后转向前方,并稍稍向下。角的断面为三角形,后上棱钝但很显著。角的基部很粗壮,其前后长约为 P2 至头骨最高点之间距离的 1/3。两角基部向后方趋近,使其间只剩一窄的缝隙。角心和额骨之间的界限很分明,额骨在角基之下呈深沟状,但不形成角柄。角表面满布纵向沟槽,其中后方的一个特别深而宽,这从顶面和后面都能看到。从前上方看,纵沟的走向表明角为微内旋型(即左角按顺时针方向旋转)。从枕面看,两角的上缘几乎形成一条直线。顶骨宽于枕骨。枕脊很清楚,在项韧带凹的两侧形成一对高耸的脊状突起。从腹面看,在枕髁的两侧有附加的关节面,使枕髁和副枕突连为一体。基枕骨呈梯形,肌结节特别发育,呈脊状突起与枕髁靠近。相反,咽结节则不发育。副枕突位于枕髁的前外方,和枕髁一起形成一条圆弧线。硬腭后缘有三个凹,中矢凹(即内鼻孔前缘)为圆弧状,远位于 M3 之后,两侧的侧凹的前端已接近 M3。

正型标本头骨上一些可测的数据如下(单位:mm):顶骨最大宽:110;副枕突处宽:95;枕高(枕脊顶端至枕髁底缘):80;头骨后面高(顶骨上缘至枕髁底缘):150;头骨在角基之前宽:140;头骨在眼眶后缘处宽:165;角基部断面纵长:120,角基部最大高:70;单角直线长:171;两角最大伸展:360。

牙齿次高冠。P2 和 P3 的前附尖和前尖外肋很明显,其内缘较圆隆,P4 的内缘较平直。上臼齿的外肋很弱,未见内柱。牙齿测量(长 × 宽,单位:mm):P2:12 × 10;P3:15 × 14;P4:14 × 15;M1:16 × 20;M2:21 × 19;M3:23 × 19;P2–P4长:40;M1–M3长:58 和 P2–M3长:94。

V 12346 上下压扁。因系一幼年个体,其角很小,两角基部距离宽。P2 和 P3 的内壁圆

隆,无中沟;中凹被后内小刺分为前大、后小的两个凹。下前臼齿的三角座均不封闭。V 12347 头骨的基部全长为 296mm。在 V 12348 头骨上角后上方的沟特别深而宽。

比较和讨论 把上述标本归入到麝牛亚科可以说是无可争议的。这主要是根据其头骨上存在只有麝牛亚科才有的一些特征作出的结论。这些特征是:角基部互相靠近,使额部大大变窄;两角水平地向侧方伸展,头骨在角后的部分很短,顶骨接近垂直于额骨额面,但枕脊向后突出,以及枕髁在两侧有附加的关节面等。

上述标本无法归入到麝牛亚科的任何一个已知的属中。目前所知本亚科最早出现的一个属大概是发现于希腊马其顿地区晚中新世早期的 *Mesembriacerus*(Bouvrain et de Bonis, 1984)。这个属个体明显地小,其上齿列平均长仅为 78.3mm。它的头骨在角后的部分还很长,角有角柄,角面没有深沟,向后直伸等,这些都与和政者差别甚大。在欧亚大陆,特别是亚洲的晚中新世中晚期出现了多种麝牛亚科的动物,如 *Plesiaddax*, *Urmiatherium*, *Tsaidamotherium* 和 *Criotherium* 等。它们在大小上与和政者比较接近,但它们的角大多很奇特。例如 *Urmiatherium* 的角本身很短小,但其基部覆盖整个头骨眼眶以后的部分(Bohlin, 1935a); *Tsaidamotherium* 的角强烈地不对称,几乎可以说是畸形(Bohlin, 1935b)。*Criotherium* 的角则是垂直向上,并强烈旋转的,带有很锐的棱嵴(Solounias, 1981)。这些都和步氏和政羊相差很远。只有 *Plesiaddax* 和步氏和政羊多少有些接近。*Plesiaddax* 的角(Bohlin, 1935a)和上述三个属的不同,不是向上生长,而是像和政羊一样向两侧平伸。但它的角特别短,末端尖,而角基部却又很大,其前端已经达到眼眶的中部水平。此外,它的角并不向前弯曲。它的牙齿也更进步些,表现在前臼齿更退化,外肋变得更弱等等。如果 *Plesiaddax* 与和政羊在系统上有一定的关系的话,那么从总体进化水平上来看,似乎 *Plesiaddax* 比和政羊更进步也更特化一些。在上新世末和更新世还有更多的麝牛类动物,其中与和政羊比较接近的只有发现于我国榆社和周口店的 *Boopsis* 属(Teilhard de Chardin, 1936, Teilhard de Chardin et Trassaert, 1938)。这个属的个体已经比和政者明显地大了。它的角也是先向两侧伸,再向前伸。但两者的差别也很明显。*Boopsis* 的角比较长,不像和政羊那样急剧收缩,它还有一短的角柄,额骨在两角基部之间形成深的中矢沟,眼眶显著地为管状,向侧前方伸出,眼眶和角基部之间收缩明显等等。在 *Boopsis* 的两个种中,产于榆社(可能是晚上新世)的 *B. breviceps* 比产于周口店第九地点(中更新世)的 *B. sinensis* 更接近和政羊一些。*B. sinensis* 的角基部的断面高大于前后长,而不是像在和政羊中那样在上下方向上压扁。*B. breviceps* 在这一点上则与和政羊相同,在上下方向上压扁。在北美更新世发现的几个属(*Bootherium*, *Symbos*, *Euceratherium* 和 *Aftonius*)中,角都与和政者明显不同;现生的 *Ovibos* 的角则先向外侧,然后急剧向下(Sokolov, 1953; McDonald et Ray, 1989)。

致谢 作者愿借此机会对和政县政府,特别是马方县长和高梓副县长,在保护和政地区新近纪脊椎动物化石方面所做出的贡献表示敬意,并感谢他们为本研究工作所提供的机会和帮助。图版的原始照片是朱生虎先生摄制的,诚致谢意!

PRELIMINARY REPORT ON A NEW GENUS OF OVIBOVINAE FROM HEZHENG DISTRICT, GANSU, CHINA

QIU Zhan-Xiang[1] WANG Ban-Yue[1] XIE Guang-Pu[2]

(1 *Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences* Beijing 100044)

(2 *Gansu Provincial Museum* Lanzhou 730050)

Key words Hezheng area of Gansu, Late Miocene, Ovibovinae

Summary

In September 1998, while visiting the museum of the Linxia Hui Autonomous Prefecture, we saw a number of skulls with apparent ovibovine affinity in the museum's storeroom. A few days later we found skulls of the same animal in a dragon-bone digger's closet mixed up with other skulls and bones of common elements of the *Hipparion* fauna. Although imperfect in preservation, we obtained the best ones from the dragon-bone digger. In January 1999, when Qiu and Xie were invited by the Hezheng county authorities to identify the fossils they acquired in the past few years, we finally realized that this unrecorded ovibovine animal should be one of the most characteristic forms of the *Hipparion* fauna of the whole Hezheng district (including the neighboring counties of Guanghe and Dongxiang). Among the thousand odd fossils, most of which were perfectly preserved skulls, 170 skulls are referable to this animal, the second largest group in number next only to the chilotheres. Elaborative study of this material needs, and has been planned, to be done in special monographs on systematic basis. Since this important ovibovine animal has never been known to science, a preliminary report is given below.

Subfamily Ovibovinae Gill, 1872

Hezhengia bohlini **gen.et sp.nov.**

(pl.I)

Type specimen HMV 0922, skull without muzzle, kept in Hezheng County Museum, discovered in Houshancun, Alimatu Village, Guanghe County, Gansu Province.

Referred specimens IVPP V 12346～12350, five skulls.

Diagnosis Medium-sized ovibovines, with its condylobasal length ～300mm. Horncores robust and short, stretching first laterally and slightly posteriorly, then anteriorly and weakly downwards, grooved, with a particularly deep posterior one, trihedral in cross-section with blunt antero-ventral and posterior ridges; horncores

sharply demarcated from frontals by deep groove, but without formation of pedicle; horncore bases strongly converging posteriorly, leaving a narrow sagittal slit between them; frontal bone ascending posteriorly, with its posterior part horizontally positioned, but without sagittal groove between horncores; parietal bones almost perpendicular to the frontals, forming an angle of about 150° with nuchal surface; condyles with lateral accessory articular surfaces; muscular tuberosities of basioccipital very prominent, ridge-formed; orbits slightly tubular in form, only weakly protruded; teeth subhypsodont; upper premolars relatively long, with strong ribs and styles, crown view of upper molars quadrate in outline, with weak ribs.

Etymology The generic name signifies the occurrence and possibly the main distribution area of the animal; and the species is donated to late Dr. B. Bohlin, a Swedish vertebrate paleontologist who made greatest contribution to the study of the Chinese fossil ovibovines.

Brief description The type specimen, HMV 0922, is a skull of middle age without muzzle. Seen from the lateral side, the dorsal profile is flat at the nasals, then ascends in the anterior half of the frontals, posterior half of which becomes flat again, so that the cranial part posterior to the middle of the orbit is markedly higher than the facial portion. The orbit is situated at the middle height of the skull. Its anterior rim is slightly behind the M3. The infraorbital foramen is located above the P3. The parietals are concave in lateral view, forming an angle of 150° with the occiput. Seen from the dorsal view, the skull is roughly wedge-shaped, pointed anteriorly. The horrncores are very robust, with their tips not very pointed. They stretch first laterally and slightly posteriorly, then anteriorly and weakly downward. They are trihedral in cross-section, with the antero-ventral ridge, the most sharp one, and the postero-superior one, the most prominent but blunt. Their bases occupy the 1/3 length from the P2 to the bregma, converging strongly posteriorly, leaving a narrow slit between their posterior borders. The horncores are sharply demarcated from the skull by the sculptured thickening of the horncore bases. The horncores are covered with multiple longitudinal grooves all around. One of the posterior grooves is particularly deep and wide, which can be clearly seen from the dorsal and posterior views. The direction of the grooves shows that the horncores are slightly homonymous. In the occipital view the upper borders of the horncores form a nearly straight line. The lambdoid crest is well defined, with a pair of ridged tuberosities besides the paired depressions for the attachment of the nuchal ligamenta. In the ventral view the condyles are widened by lateral accessory articular surfaces, which connect the condyles with the paroccipital processes. The basioccipital is trapezoid in form, with very prominent ridged muscular tuberosities, which connect the condyles, but the pharyngeal ones are only weakly developed. The paroccipital processes are situated

antero-laterally to the condyles, thus forming a curved line with the latter. The posterior border of the palate is tri-partite, with the two lateral incisions situated slightly posterior to the M3, while the sagittal one (anterior margin of the choana) is well behind the lateral incisions.

The measurements of the skull are (all in mm): The greatest width of the parietals (above) is 110; the width at the paroccipital processes is 95; the height from the top of the lambdoid crest to the bottom of the condyles is 80; the height from the top of the parietals to the bottom of the condyles is 150; the width of the skull at the anterior borders of the horncores is 140; the width at the posterior borders of the orbits is 165; the length of the cross-section at the base of the horncore is 120, its height is 70; the rectilineal length of one horncore is 171 and the total extention of the two horncores is about 360.

The teeth are subhypsodont. The parastyle and the paracone rib are prominent in P2 and P3. The lingual side is rounded in P2 and P3, but more or less flat in P4. The ribs on the external walls are weakly developed and no lingual columns are observed in the upper molars. The measurements of the teeth [L (length) × W (width), in mm]: P2: 12 × 10; P3: 15 × 14; P4: 14 × 15; M1: 16 × 20; M2: 21 × 19; M3: 23 × 19; L (length) of P2～P4 is 40; M1～M3 (L): 58 and P2～M3 (L): 94.

Comparison and discussion The referral of the above listed specimens to the Ovibovinae is warranted by the exclusively ovibovine features as the extreme closing-up of the bases of the horncores, the horizontal stretching of the horncores, the almost vertical position of the parietal and occipital surfaces with a protruded lambdoid crest, and the presence of accessory articular surfaces besides the condyles.

However, the above specimens can not be referred to any known genera of the Ovibovinae. The earliest and most primitive ovibovine is probably *Mesembriacerus* from the European Vallesian of Macedonia (Bouvrain et de Bonis, 1984). It is smaller in size and far more primitive than *Hezhengia*. The cranial part posterior to the horncores in *Mesembriacerus* remains very large. Its horncores are situated on short pedicles, rounded in cross-section, not strongly grooved, and stretching posteriorly. *Hezhengia* is more or less close to the Turolian (Baodean) ovibovines in size, like *Plesiaddax*, *Urmiatherium*, *Tsaidamotherium* and *Criotherium*. Horncores in the last three genera are not only bizarre in form, but also stretch vertically (Bohlin, 1935a, b; Solounias, 1981). *Plesiaddax* (Bohlin, 1935a) is somewhat similar to *Hezhengia* in the direction of stretching of horncores, but differs from the latter in having extremely short horncores with pointed extremities and wide bases. The premolars of *Plesiaddax* are proportionally more reduced relative to its molars. Among the Pliocene and Quaternary ovibovines *Boopsis* is the form most similar to *Hezhengia* in morphology of the horncores. The horncores in that genus stretch first laterally and then anteriorly

as in *Hezhengia*. However, a number of characters distinguish *Boopsis* clearly from *Hezhengia*. In *Boopsis*, the constriction behind the orbits is remarkable, the horncores are supported by short pedicles, and the frontal area between the horncores is deeply grooved. *Boopsis sinensis* from Zhoukoudian Loc. 9 is distinguished further from *Hezhengia* in having antero-posteriorly flattened horncores (Teilhard de Chardin, 1936). Compared with *B. sinensis*, *B. breviceps* from Yushe is more similar to *Hezhengia* in the shape of the horncore cross-section. Its horncores are also vertically flattened (Teilhard de Chardin et Trassaert, 1938). Forms from North American Quaternary, *Bootherium*, *Symbos*, *Euceratherium* and *Aftonius*, have their horncores quite different from those of *Hezhengia*. The horncores in the living *Ovibos* stretch first laterally, but then strongly downward and slightly upturned at their tips. Therefore, all the known American forms can easily be distinguished from *Hezhengia* (Sokolov, 1953; McDonald et Ray, 1989).

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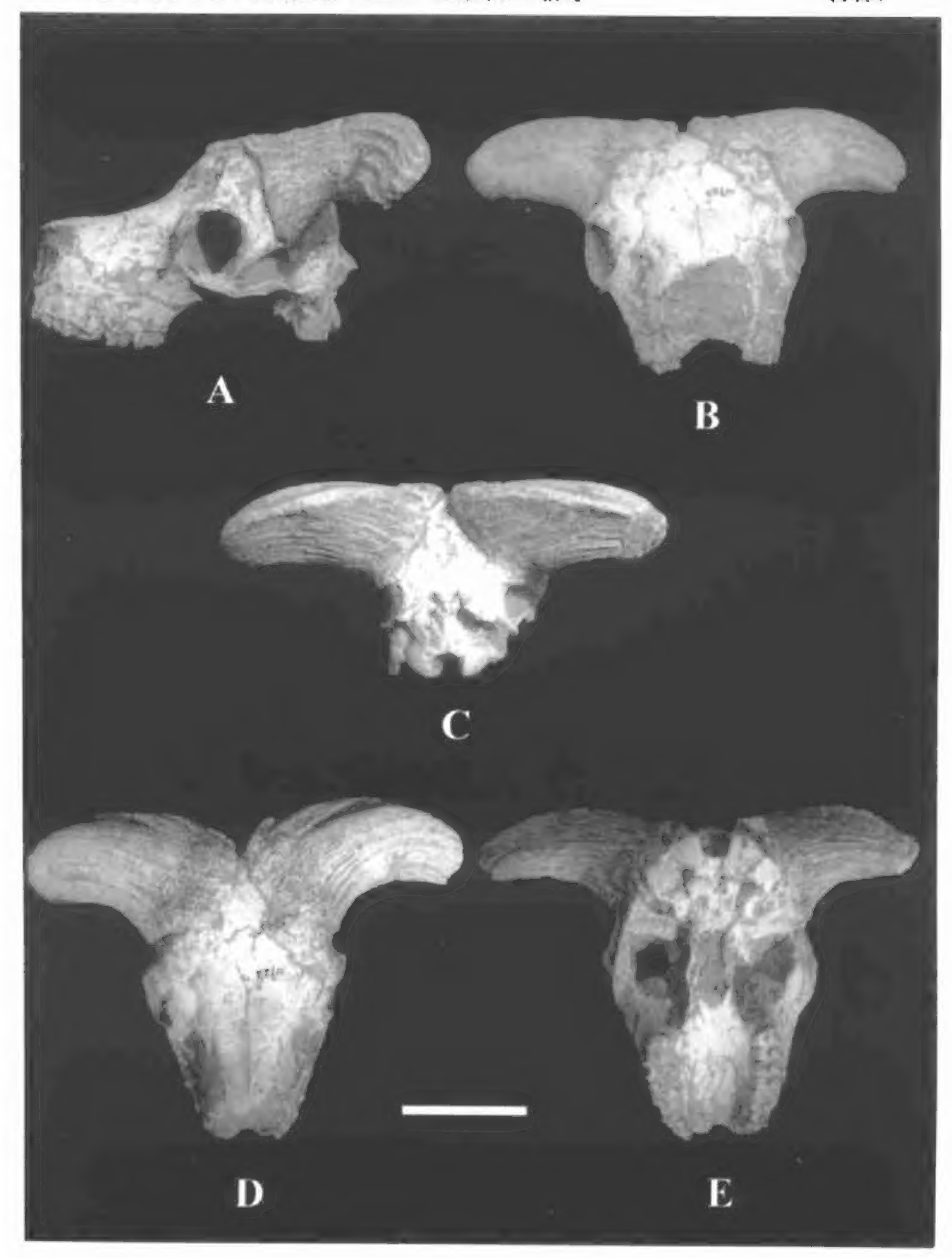
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图版 I 说明(Explanations of Plate I)

步氏和政羊(新属、新种)(*Hezhengia bohlini* gen. et sp. nov.),头骨,正型标本(skull of holotype, HMV 0922)

A. 左侧视(left lateral view), B.前视(anterior view), C. 后视(posterior view), D. 背视(dorsal view), E. 腹视(ventral view), 标尺(scale) = 10cm


A
B
C
D
E